

REMARKS

The Official Action rejects Claims 59-64 under 35 U.S.C. § 112, second paragraph, as being indefinite. In particular, the Official Action contended that the recitation of "terrain source data that is most representative of the anticipated flight conditions" was indefinite. Applicant's undersigned representative discussed this rejection with the Examiner on February 22, 2005 and it was agreed that the recitation of "terrain source data that is most representative of the anticipated flight conditions" did particularly point out and distinctly claim the subject matter regarded as the invention and that the rejection of Claims 59-64 under 35 U.S.C. § 112, second paragraph, was therefore overcome. Since Claims 59-64 were not otherwise rejected, Applicant submits that Claims 59-64 are in condition for allowance.

The Official Action maintained its rejection of Claims 1 – 10, 12 – 14, 16 – 29 and 31 under 35 U.S.C. § 103(a) as being obvious in light of U.S. Patent No. 5,892,462 to My Tran in view of U.S. Patent No. 6,268,858 to Cheryl N. Nathman, et al. Dependent Claims 11, 15 and 30 continue to be rejected under 35 U.S.C. § 103(a) as being unpatentable over the Tran '462 patent and the Nathman '858 patent, in further view of U.S. Patent No. 4,985,854 to Timothy M. Wittenburg, in conjunction to Claim 11 and in view of U.S. Patent No. 5,381,338 to David A. Wysocki, et al. in conjunction with Claims 15 and 30. Further, dependent Claims 55-58 remain rejected under 35 U.S.C. § 103(a) as being unpatentable over the Tran '462 patent and the Nathman '858 patent, in further view of U.S. Patent No. 6,370,539 to Richard A. Ashby, et al. As described below, independent Claims 1 and 17 are patentably distinct from the cited references, taken either individually or in combination, such that the rejections under 35 U.S.C. § 103(a) are traversed. Moreover, a number of the dependent claims recite additional features that are not taught or suggested by the cited references, taken either individually or in combination. As such, Applicant respectfully requests reconsideration of the application and allowance of the claims.

As set forth by independent Claims 1 and 17, an apparatus and method, respectively, are provided for automatically generating a terrain model for display during a simulated flight. Initially, the area containing the mission route for which terrain source data is required is determined. A plurality of predefined electronic collections of terrain source data are then

automatically searched to identify terrain source data covering the area containing the mission route. The terrain source data is subsequently processed into one or more predefined formats and is then automatically compiled to create a terrain model for display during flight simulation.

Independent Claims 1 and 17 each further define the manner in which the plurality of predetermined electronic collections of terrain source data are searched. By way of example, independent method Claim 17 recites that terrain source data is identified from at least two **alternative** predefined electronic collections of terrain source data that each represent a common region of the area containing the mission route and that the terrain source data from which the terrain model is subsequently constructed is selected from only one of the **alternative** predefined electronic collections of terrain source data to represent the common region of the area containing the mission route. Independent apparatus Claim 1 further defines the search engine in an analogous manner to be capable of performing these same functions as described above in conjunction with independent Claim 17.

By way of further explanation, the searching of a number of different electronic collections of terrain source data, such as collections maintained by JSIPS, USIGS, MEL, the National Weather Service, USGS and commercial satellite services, advantageously permits the method and apparatus of the claimed invention to construct an accurate and up-to-date terrain model that is appropriate for the current and/or anticipated flight conditions. As described by page 13, lines 17 – 28 of the present application:

In searching the electronic collections of terrain source data, the search engine will oftentimes identify terrain source data maintained by different electronic collections that depict the same portion of the area. In these instances, the search engine reviews the terrain source data from each electronic collection and selects the terrain source data that is of the highest quality and is most recent. For example, the search engine will select a digital photograph of a portion of the area taken on a clear day in the past week instead of a digital photograph of the same portion of the area taken on an overcast day two months ago, assuming that the mission is intended to be performed on a clear day. As such, the digital photograph taken on a clear day will be more representative of the situation with which the pilot will actually be confronted during the flight.

In other words, one embodiment of the method and apparatus of independent Claims 1 and 17 identifies several different alternative collections of terrain source data that depict the

same region and then selects one collection, i.e., one source, of the terrain source data for the region (typically the collection that best represents the region). The terrain source of this one collection is then processed and compiled to create that portion of the terrain model that is representative of the region.

The primary reference, i.e., the Tran '462 patent, does not teach or suggest the method and apparatus of amended independent Claims 1 and 17. The Tran '462 patent describes a ground collision avoidance system for use during actual flight, as opposed to use in conjunction with flight simulation operations as per the claimed invention. In this regard, the Official Action incorrectly indicates at several places that the Tran '462 patent creates a terrain model for display during flight simulation. See pages 3 and 4 of the Official Action. Instead, the ground collision avoidance system of the Tran '462 patent utilizes a digital terrain elevation database to generate a terrain model of the terrain over which the aircraft is flying – during an actual flight as opposed to a simulation to which the claimed invention is directed. The ground collision avoidance system utilizes inputs from various onboard sensors, such as active terrain sensors and/or the radio altimeter, to update the terrain data provided by the digital terrain elevation database. Thus, any variations between the prestored terrain data and the readings obtained by the onboard sensors can be detected and the terrain data can be updated.

While the Tran '462 patent does describe the correction or updating of prestored terrain data, the final Official Action recognized that the Tran '462 patent “does not specifically disclose identifying terrain source data from at least two alternative predefined electronic collections of terrain source data that represents a common region of an area containing the mission route”, as recited by independent Claims 1 and 17. See page 3 of the Official Action. The final Official Action therefore cited the Nathman '858 patent for its alleged disclosure of separate, predefined electronic collections of terrain source data covering a common region containing a mission route with the user being able to select from one or more collections for use during simulation. As described below, however, the Nathman '858 patent also fails to teach or suggest identifying terrain source data from at least two **alternative** predefined electronic collections of terrain source data that represents a common area containing the mission route, and thereafter selecting the terrain source data from only one of the alternative predefined electronic collections to

represent the common region containing the mission route, as recited by independent Claims 1 and 17.

The Nathman '858 patent describes a method and system for generating hard copies of navigational charts (termed "database correlatable navigational charts") that correlate to and are reflective of a non-real-world visual database. In his regard, a visual database may be constructed and updated for use during flight simulation. According to the Nathman '858 patent, the visual database can be printed in hard copy form as shown in Figure 5 to include the simulated terrain and cultural features. The hard copy may be utilized for various purposes including its use in planning routes in advance of a simulation exercise. As it can be time consuming to verify the accuracy of a visual database, the hard copy may be utilized to more easily verify the accuracy of the visual database. In this regard, a hard copy of a visual database may be generated and then portions of the hard copy may be compared to the visual database to confirm that the hard copy is reflective of the visual database. The resulting hard copy can then be checked for accuracy and, if the accuracy of the hard copy of the navigational charts is verified, the accuracy of the visual database will also be considered to have been verified. See, for example, column 2, lines 6-24 of the Nathman '858 patent which describes this verification process and the savings in terms of man-hours and down-time of the flight simulator that are achieved by utilizing a hard copy of the navigational charts for verification purposes.

In terms of originally constructing the visual database, the method and system of the Nathman '858 patent receive source data in a number of different cartographic formats. This source data is then pre-processed with configuration data to recreate a central database that includes "terrain data, elevation data, cultural data, an object library (e.g., icons for radio towers, bridges and dams), a texture library (e.g., a swamp v. a lake), color tables (e.g., blue for water and purple for roads), surface material tables (e.g., asphalt, wood or soil), feature description tables (e.g., the size and orientation of a warehouse), and other utilities or algorithms appropriate to the visual database (e.g., polygonizing assumptions)." See column 3, lines 21-28 of the Nathman '858 patent. As described in column 4, lines 22-31 of the Nathman '858 patent, the cultural data generally includes three types of cultural features, "namely aerial features (e.g.,

towns and lakes), lineal features (e.g., highways and railroad tracks) and point features (e.g., radio towers and buildings).

Unlike the apparatus and method of independent Claims 1 and 17, however, the Nathman '858 patent fails to teach or suggest the identification of at least two alternative electronic collections of terrain source data and the subsequent selection of terrain source data from only one of the alternative collections. In this regard, the Official Action contends that the "database verification embodiment" involves a choice between two alternative electronic collections of terrain source data in stating that "the Nathman reference recites a database verification embodiment in which a plurality of databases containing visual references and other terrain features are correlated against database correlatable charts, which are themselves electronic collections of terrain source data, to determine data accuracy." As explained above, the "database correlatable charts" are not "electronic collections of terrain source data" as submitted by the Official Action. Instead, the database correlatable charts are hard copies, i.e., paper copies, that are generated from the visual database and that may be reviewed for accuracy in order to provide an indirect verification of the visual database without having to invest the manpower and simulator time required to simulate flight throughout the entire visual database. For example, the Nathman '858 patent provides a substantial discussion of the use of plotters or printers to generate the database correlatable charts including column 4, lines 60-62 which states "a series of routines will be executed to plot all of the features on the hard-copy (e.g., paper) of the database correlatable chart" and column 9, lines 44-45 in which the final step of Claim 1 is "generating a hard copy of a navigational chart which is correlated to said non-real-world visual database".

Since the database correlatable chart is not a predefined electronic collection of terrain source data and is not an alternative source of terrain source data for flight simulation purposes, the correlation of the visual database to a database correlatable chart in the Nathman '858 patent does not teach or suggest the identification of at least two alternative predefined electronic collections of terrain source data nor the selection of terrain source data from only one of the alternative predefined electronic collections of terrain source data, as suggested by the Official Action. Moreover, the construction of the visual database itself does not involve the selection of

terrain source data from only one of the alternative predefined electronic collections of terrain source data, as recited by independent Claims 1 and 17. Indeed, while the Nathman '858 patent has access to a number of different types of source data during the construction of the visual database, the different types of source data are not alternatives to one another as recited by the claimed invention. Instead, the different types of source data are used in a collaborative fashion to generate the visual database. Thus, the Nathman '858 patent generates the visual database based upon a compilation of several different types of source data and does not select only one of several alternative electronic collections of terrain source data to represent the common region as also recited by the claimed invention. By way of example, Figure 5 of the Nathman '858 patent depicts a chart that is produced by the disclosed system and method with reference to at least a collection of terrain data, a collection of elevation data and a texture library, as well as perhaps other collections of source data.

The other references, that is, the Wittenburg '854 patent, Wysocki '338 patent and the Ashby '539 patent, also fail to teach or suggest the apparatus and method of independent Claims 1 and 17 and, in fact, continue to only be applied to certain dependent claims by the Official Action. In particular, the Wittenburg '854 patent, the Wysocki '338 patent and the Ashby '539 patent similarly fail to teach or suggest identifying terrain source data from at least two alternative predefined electronic collections of terrain source data that represents a common area containing the mission route, and thereafter selecting the terrain source data from one of the alternative predefined electronic collections to represent the common region containing the mission route, as recited by independent Claims 1 and 17.

In contrast, while the Ashby '539 patent is only cited for its discussion of metadata, both the Wittenburg '854 patent and the Wysocki '338 patent describe the combination of a digitized photograph with elevation data to transform a two-dimensional photograph into a three-dimensional terrain model. Thus, while both the digitized photograph and the elevation data may represent the same region, neither the Wittenburg '854 patent nor the Wysocki '338 patent selects the terrain source data from one alternate collection of terrain source data to represent the common region. In other words, neither the Wittenburg '854 nor the Wysocki '338 patent teach or suggest treating the digitized photograph and the elevation data as alternatives and selecting

one of the alternative sources of terrain source data. Instead, in an analogous manner to the Nathman '858 patent, the systems of the Wittenburg '854 patent and the Wysocki '338 patent are specifically designed to utilize both the digitized photograph and the elevation data to construct a terrain model.

Since none of the cited references teach or suggest the identification of terrain source data from at least two alternative predefined electronic collections of terrain source data that represents a common area containing the mission route, and thereafter the selection of the terrain source data from one of the alternative predefined electronic collections to represent the common region containing the mission route, as recited by independent Claims 1 and 17, any combination of the cited references similarly fails to teach or suggest the apparatus and method of independent Claims 1 and 17. Thus, Applicant respectfully submits that the rejection of independent Claims 1 and 17 is therefore overcome.

The dependent claims include the recitations of a respective independent claim and are therefore patentably distinct from the cited references for at least the same reasons as described above in conjunction with the respective independent claims. However, a number of the dependent claims, including, for example, Claims 59-64, include additional recitations that are not taught or suggested by the cited references and are therefore patentably distinct for these additional reasons.

In this regard, dependent Claims 3-6 and 19-22 recite that the area is automatically divided into a plurality of regions based upon the mission route and a respective resolution of the terrain source data for each region is determined. As explained by the present application, the division of the area into regions that may have different respective resolutions permit certain regions to be imaged with greater resolution, such as those regions in the vicinity of a target, while other regions are imaged with less resolution, thereby conserving memory space and improving the speed with which the image data can be processed. In contrast, none of the cited references teach or suggest the division of an area into a number of regions, each of which may have a respective resolution. In this regard, the Tran '462 patent that is cited by the final Official Action discloses a digital terrain model that is divided into regions, but does not teach or suggest that the resolution for any one region is any different than any other region as contemplated by

dependent Claims 3-6 and 19-22. Thus, dependent Claims 3-6 and 19-22 are patentably distinct from the cited references when taken either individually or in combination, for this additional reason.

In addition, dependent Claims 8 and 24 recite that terrain source data from prior mission routes is stored. Further, dependent Claims 9-11 and 25-26 build upon Claims 8 and 24, respectively, by describing the utilization of the terrain source data from prior mission routes as one of the predefined electronic collections of terrain source data from which the terrain model is constructed. The Official Action continues to indicate that column 5, lines 57-62 of the Tran '462 patent describes the storage of data from prior mission routes. However, the Tran '462 patent does not teach or suggest the storage of data from prior mission routes. Instead, the passage from the Tran '462 patent that was referenced by the Official Action relates to the use of information from a variety of onboard systems, none of which are described to be providing any data from prior mission routes. Likewise, none of the other cited references teach or suggest the storage of terrain source data from prior mission routes and the use of terrain source data from prior mission routes as one of the predefined electronic collections of terrain source data, as recited by dependent Claims 8-11 and 24-26. Thus, dependent Claims 8-11 and 24-26 are patentably distinct from the cited references, taken either individually or in combination, for these additional reasons.

Consideration Of Previously Submitted Information Disclosure Statement

It is noted that an initialed copy of the PTO Form 1449 that was submitted with Applicant's Supplemental Information Disclosure Statement filed March 23, 2004 and resubmitted with the prior Amendment dated October 27, 2004 has not been returned to Applicant's representative with the Office Action. Accordingly, it is requested that an initialed copy of the Form 1449 be forwarded to the undersigned with the next communication from the PTO. In order to facilitate review of the references by the Examiner, a copy of the Supplemental Information Disclosure Statement and the Form 1449 are attached hereto. Copies of the cited references were provided at the time of filing the original Information Disclosure Statement, and, therefore, no additional copies of the references are submitted herewith. Applicant will be

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pleased to provide additional copies of the references upon the Examiner's request if it proves difficult to locate the original references.

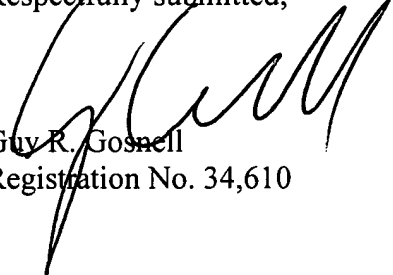
Conclusion

In view of the foregoing remarks, Applicant submits that the rejections raised by the Official Action have been overcome, and that the application is in condition for allowance. As such, Applicant respectfully requests the issuance of a Notice of Allowance. If there remain any issues with respect to the present application, it is requested that the Examiner contact Applicant's undersigned attorney in order to expeditiously advance examination of the present application.

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It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

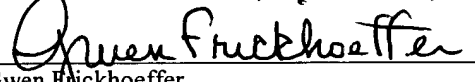


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